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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/714,065

11/14/2003

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EXAMINER

RUTHKOSKY, MARK

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/714,065	<b>Applicant(s)</b> SUGAWARA ET AL.	
	<b>Examiner</b> Mark Ruthkosky	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) 5-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

The amendment to the claims filed 5/5/2008 has been entered into the application file and considered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwagi (US 2002/0136942) in view of Kobayashi et al. (JP2002-33110A.)

The instant claims are to a fuel cell system comprising a fuel cell for generating power by being supplied with a fuel gas and an oxidizing gas; a fuel gas supply path for supplying a fuel gas to the fuel cell; a fuel off-gas circulation path for returning a fuel off-gas discharged from the fuel cell to the fuel gas supply path; an ejector, provided in the fuel gas supply path and driven by fluid flow energy, for supplying the fuel off-gas in the fuel off-gas circulation path flow to the fuel gas supply path; a fuel pump, provided in the fuel off-gas circulation path or on the fuel gas supply path and downstream with respect to the ejector, and driven by a rotating machine, for pressurizing the fuel off-gas; a discharge valve for discharging the fuel off-gas from the fuel off-

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gas circulation path; and a control means for closing the discharge valve and for operating the fuel pump upon start-up of the fuel cell.

With regard to the control means, it is noted that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Cited in MPEP, In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997.) A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Cited in MPEP, Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987.)

Kashiwagi (US 2002/0136942) teaches a fuel cell system comprising a fuel cell for generating power by being supplied with a fuel gas and an oxidizing gas; a fuel gas supply path for supplying a fuel gas to the fuel cell; a fuel off-gas circulation path for returning a fuel off-gas discharged from the fuel cell to the fuel gas supply path; an ejector, provided in the fuel gas supply path and driven by fluid flow energy, for supplying the fuel off-gas in the fuel off-gas circulation path flow to the fuel gas supply path; a fuel pump, provided in the fuel off-gas circulation path or on the fuel gas supply path and downstream with respect to the ejector, and driven by a rotating machine, for pressurizing the fuel off-gas (see figures 1-3 and 7, the corresponding text and the claims.) A control device is operatively connected to the fuel pump. The reference does not teach a discharge valve for discharging the fuel off-gas from the fuel off-gas circulation path or a control device operatively connected to the discharge valve. The

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reference teaches a discharge section for discharging gas to the atmosphere; however no valve is expressly cited. Further, the reference does not teach a voltage-measuring device.

Kobayashi et al. (The teachings of Kobayashi will be reference to the corresponding US patent 6,844,094, as it is printed in English), however, teaches a teaches a fuel cell system comprising a fuel cell for generating power by being supplied with a fuel gas and an oxidizing gas; a fuel gas supply path for supplying a fuel gas to the fuel cell; a fuel off-gas circulation path for returning a fuel off-gas discharged from the fuel cell to the fuel gas supply path; and an ejector, provided in the fuel gas supply path and driven by fluid flow energy, for supplying the fuel off-gas in the fuel off-gas circulation path flow to the fuel gas supply path (see figures 1-2, the claims and column 4.) The fuel cell system includes a discharge valve for discharging the fuel off-gas from the fuel off-gas circulation path and a control device operatively connected to the discharge valve (see col. 6, line 30 to col. 7, line 30.)

With regard to the limitation that the control means closes the discharge valve and operates the fuel pump upon start-up of the fuel cell, the steps of closing the discharge valve and operating the fuel pump upon start-up of the fuel cell are functional limitations, intended use statements and process steps. Because the claims are to a fuel cell system, the limitation has been considered with regard to structure, but the function is not given patentable weight. MPEP 2114, under the following headings, states: APPARATUS CLAIMS MUST BE STRUCTURALLY DISTINGUISHABLE FROM THE PRIOR ART. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997.) MANNER OF OPERATING

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THE DEVICE DOES NOT DIFFERENTIATE APPARATUS CLAIM FROM THE PRIOR ART A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987.) The prior art teaches a control unit connected with both the discharge section and fuel pump. Therefore, the structural feature of the limitation are met by the cited prior art.

With regard to claims 3-4 and 10, Kobayashi et al. (JP2002-33110A) teaches that the control unit receives an output demand signal from the fuel cell output to give a target power generation amount. The control unit operates the gas-supply apparatus and the supply air to control the reactant flow to meet the needs of the system (see col. 7, lines 1-45; col. 9, line 40 to col. 10, line 55, claims 1-14.) The reference further teaches a voltage-measuring device (claims 6-7 and 11-12.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a discharge valve for controlling the direction of flow from the anode exhaust to either 1.) exhaust the spent fuel from the system or 2.) to recycle the flow of the fuel to through the recycle loop to the fuel source as taught in both Kashiwagi (US 2002 /0136942) and Kobayashi et al. (JP2002-33110A) to further utilize unreacted hydrogen in the exhaust. In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a voltage-measuring device in the fuel cell system to measure the cell voltage of the fuel cell in order to regulate the pressure of the supply gas as taught in Kobayashi et al. (JP2002-33110A) and supply the appropriate amount of fuel to the fuel cell electrode. The artesian would have found the claimed invention to be obvious in light of the

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teachings of the references. With regard to the limitation that the control device controls based on the voltage at start-up of the fuel cell, the steps of opening the discharge valve are functional limitations, intended use statements and process steps. These steps do not impart structure on the claims as previously noted.

With regard to claims 1 and 9, the Kashiwagi (US 2002/0136942) reference teaches that the fuel pump and recirculation flow paths are activated upon the start-up of the fuel cell (col. 3-4.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to close a valve at the anode exhaust to flow gas through the recirculation passage of the system. This will allow for more exhaust to flow in the direction of recirculation as taught in Kobayashi et al. (JP2002-33110A) allowing for a more efficient system. One skilled in the art would be motivated to use a control means, such as a computer as taught in the references of record, to close the discharge valve and start the fuel pump in order to generate electrons at the fuel electrode and allow for fuel exhaust to be recycled into the fuel off-gas circulation path for returning a fuel off-gas discharged from the fuel cell to the fuel gas supply path. The artisan would have found the claimed invention to be obvious in light of the teachings of the references.

### ***Response to Arguments***

Applicant's arguments filed 5/5/2008 have been fully considered but are not persuasive.

Applicants have amended claim 1 to recite control means for closing the discharge valve and operating the fuel cell pump upon start of the fuel cell. Applicant argues that, "amended claims 1-4 and 10 are "means- plus-function" claims invoking 35 U.S.C. § 112, P 6. A claim

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limitation will be presumed to invoke 35 U.S.C. § 112, P 6, if it meets the following 3-prong analysis:

- (A) the claim limitations must use the phrase "means for" or "step for;"
- (B) the "means for" or "step for" must be modified by functional language; and
- (C) the phrase "means for" or "step for" must not be modified by sufficient structure, material, or acts for achieving the specified function. See MPEP § 2181.

Applicants respectfully submit that the amended claims meet the 3-prong analysis outlined in MPEP § 2181.”

This argument is not persuasive. The amended claims do not meet the 3-prong analysis outlined in MPEP § 2181 because the phrase "means for" is modified by sufficient structure, material, or acts for achieving the specified function. See MPEP § 2181. The claims recite the limitation that the control means closing the discharge valve and operating the fuel pump occurs upon start-up of the fuel cell. Applicant is claiming that the control means both closes the discharge valve and operates the fuel pump. These two sufficient acts are for achieving the different functions. Further, the limitation requires that the acts occur upon start-up of the fuel cell. This adds further structure with respect to the “means for.” Thus, the “means for...” is modified by sufficient acts for achieving the specified function.

Applicants respectfully submit that the combination of the Kashiwagi reference and the Kobayashi reference do not teach or suggest control means for closing the discharge valve and operating the fuel cell pump upon start of the fuel cell, as recited in claim 1. Applicant further argues, “that the Examiner relies on the Kobayashi reference for the teaching of a discharge valve for discharging the fuel off-gas from the fuel off- gas circulation path or a control device



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operatively connected to the discharge valve. However, the combination of the Kashiwagi reference and the Kobayashi reference do not teach or suggest control means for closing the discharge valve and operating the fuel cell pump upon start of the fuel cell, as recited in claim 1.”

As noted in the rejection with respect to the amended claims, the Kashiwagi (US 2002/0136942) reference teaches that the fuel pump and recirculation flow paths are activated upon the start-up of the fuel cell (col. 3-4.) Kobayashi et al. teaches a teaches a fuel cell system comprising a fuel cell with a fuel off-gas circulation path for returning a fuel off-gas discharged from the fuel cell to the fuel gas supply path, a discharge valve for discharging the fuel off-gas from the fuel off-gas circulation path and a control device operatively connected to the discharge valve (see col. 6, line 30 to col. 7, line 30.) Based on these teachings and the ordinary knowledge of the art, it would have been obvious to one of ordinary skill in the art at the time the invention was made to close a valve at the anode exhaust to flow fuel through the recirculation passage of the system. This will allow for more exhaust to flow in the direction of recirculation as taught in Kobayashi et al. (JP2002-33110A) allowing for a more efficient system. One skilled in the art would be motivated to use a control means, such as a computer as taught in the references of record, to close the discharge valve and start the fuel pump in order to generate electrons at the fuel electrode and allow for fuel exhaust to be recycled into the fuel off-gas circulation path for returning a fuel off-gas discharged from the fuel cell to the fuel gas supply path. The artesian would have found the claimed invention to be obvious in light of the teachings of the references.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Examiner Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

/Mark Ruthkosky/

Primary Examiner, Art Unit 1795